1. A method of using PFCs recovered from the effluent of a CVD chamber cleaning process as an influent for the CVD chamber cleaning process, comprising the steps of:

    (a) selecting a first PFC gas mixture having a first ratio of C_2F_6 to CF_4;

5   (b) providing the first PFC gas mixture as the influent gas to the CVD chamber, wherein the influent gas reacts during the cleaning process to create a CVD chamber effluent gas comprising a second PFC gas mixture having a second ratio of C_2F_6 to CF_4;

    (c) adding virgin C_2F_6 or CF_4 to the CVD chamber effluent gas in sufficient
10   quantity to create a third PFC gas mixture having the first ratio of C_2F_6 to CF_4;

    (d) using the third PFC gas mixture as the influent gas to the CVD chamber; and

    (e) continuing to add virgin C_2F_6 or CF_4 to the CVD chamber effluent gas to
15   create the third PFC mixture and continuing to use the third PFC gas mixture as the influent gas to the CVD chamber.

2. The method of claim 1, including the step of providing O_2 to the third PFC gas mixture for use as influent gas to the CVD chamber.

20

3. The method of claim 1, wherein the third ratio of C_2F_6 to CF_4 is less than or equal to the following equation:

$$\frac{(1 - C + (C \cdot U))}{G \cdot C}$$

25   where U= Utilization of CF_4 in the plasma; G= Generation frequency of CF_4 from C_2F_6; and C = Capture efficiency of CF_4, and the first ratio of C_2F_6 to CF_4 is selected based on the third ratio of C_2F_6 to CF_4.

4.   The method of claim 1, wherein the third ratio of C_2F_6 to CF_4 is less than or equal to about 0.32, and the first ratio of C_2F_6 to CF_4 is selected based on the third ratio of C_2F_6 to CF_4.

5.   The method of claim 1, wherein the third ratio of C_2F_6 to CF_4 is greater than or equal to 1, and the first ratio of C_2F_6 to CF_4 is selected based on the third ratio of $\dot{C}_2F_6$ to CF_4 .

6.   The method of claim 5, wherein the third ratio of C_2F_6 to CF_4 is adjusted by increasing the O_2 concentration.

7.   The method of claim 5, wherein the third ratio of C_2F_6 to CF_4 is adjusted by using higher C_2F_6 flowrates.

8.   The method of claim 1, wherein the amount CF_4 in the effluent is less than or equal to the amount of CF_4 in the influent.

9.   The method of claim 1, wherein the total gas volume of the effluent is less than or equal to the total gas volume of the influent.

10.   A method of using PFCs recovered from the effluent of a CVD chamber cleaning process as an influent for the CVD chamber cleaning process, comprising the steps of:

        (a)   selecting a first PFC gas mixture having a first ratio of C_2F_6 to CF_4 greater than or equal to 1;

        (b)   providing the first PFC gas mixture as the influent gas to the CVD chamber, wherein the influent gas reacts during the cleaning process to

-12-

create a CVD chamber effluent gas comprising a second PFC gas mixture having a second ratio of C_2F_6 to CF_4;

(c)   adding virgin C_2F_6 or CF_4 to the CVD chamber effluent gas in sufficient quantity to create a third PFC gas mixture having the first ratio of C_2F_6 to CF_4;

(d)   using the third PFC gas mixture as the influent gas to the CVD chamber; and

(e)   continuing to add virgin C_2F_6 or CF_4 to the CVD chamber effluent gas to create the third PFC mixture and continuing to use the third PFC gas mixture as the influent gas to the CVD chamber.

11.   The method of claim 10, including the step of providing O_2 to the third PFC gas mixture for use as influent gas to the CVD chamber.

12.   The method of claim 10, wherein the third ratio of C_2F_6 to CF_4 is adjusted by increasing the O_2 concentration.

13.   The method of claim 10, wherein the third ratio of C_2F_6 to CF_4 is adjusted by using higher C_2F_6 flowrates.

14.   The method of claim 10, wherein the amount CF_4 in the effluent is less than or equal to the amount of CF_4 in the influent.

15.   The method of claim 10, wherein the total gas volume of the effluent is less than or equal to the total gas volume of the influent.

N:\DOCNOS\06100-06199\06142\US\APPLN\06142 USA.DOC